Proposed Land Use Methods and Metrics Outcome Indicators for 2022

Peter R. Claggett and Sarah McDonald
Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey, Annapolis, MD 21403

Status and Trends Workgroup
August 8, 2022

U.S. Department of the Interior
U.S. Geological Survey

Questions for…

LUWG:
Are the land use/land cover (LULC) data accurate?
Are the aggregations of the LULC data for the LUMM metrics logical and valid?

WQGIT:
Are the proposed interpretations of the metrics for water quality valid?
Are the metrics consistent with, and/or complement CAST?

HWGIT:
Are the proposed interpretations of the metrics for watershed health valid?
Are the metrics consistent with, and/or complement, the Chesapeake Healthy Watershed Assessment?

STWG:
Which of the proposed indicators are appropriate for hosting on Chesapeake Progress?
Are the documentation, maps and charts accurate, clear, and sufficient for Chesapeake Progress?

LUMM Indicators Proposed for Release in 2022

Impervious Cover[1] (2017/18) and Impervious Cover Change (2013-2017)
Percent and area (acres) of impervious cover and impervious cover change by catchment, watershed*, and county

Tree Cover[2] (2017/18) and Tree Cover Change (2013/14 – 2017/18)
Percent and area (acres) of tree cover and tree cover change by catchment, watershed, and county

Natural[3] Land (2017/18) and Natural Land Change (2013/14 – 2017/18)
Percent and area (acres) of natural land and natural land change by catchment, watershed, and county

Forest[4] (2017/18) and Forest Change (2013/14 – 2017/18)
Percent and area (acres) of forest and forest change by catchment, watershed, and county

Community Tree Cover[5] (2017/18) and Community Tree Cover Change (2013/14 – 2017/18)
Percent and area (acres) of developed tree cover and developed tree cover change by catchment, watershed, and county

[1] Impervious Cover = roads, structures, parking lots, and tree canopy overhanging such features
[2] Tree Cover = forests, forested wetlands, other tree canopy, tree canopy over turf grass, and tree canopy over impervious surfaces
[3] Natural land = forests, other tree canopy, all wetlands, and early-stage forests (areas recently harvested or undergoing succession
[4] Forests = patches of tree cover that are >= 1 acre in size with 240-ft (70m) minimum width somewhere within each patch.
[5] Developed Tree Cover = tree canopy over turf grass, and tree canopy over impervious surfaces

Percent Impervious Cover by Watershed

What?

Indicator of development and associated with the permanent conversion of pervious surfaces (e.g., farm fields, forests, and open space).

Applies to:

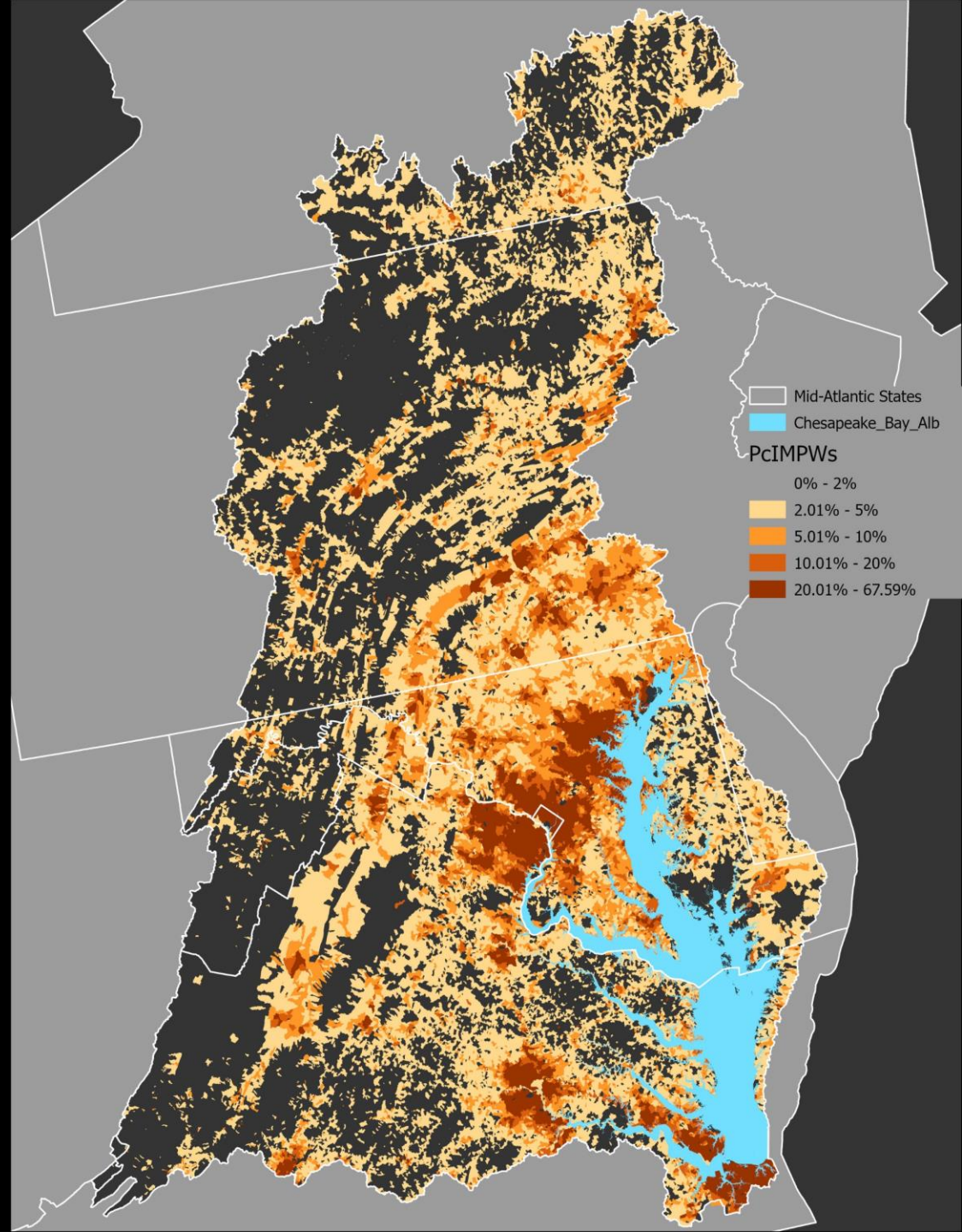
Watershed health, Water Quality, and Communities

Why?

Impervious surfaces can lead to water quality and watershed health degradation by altering stream flows, stream temperature, soil erosion, and the transport of nutrients, toxic chemicals, road salts, and sediment to streams.

While watersheds with less than 10% impervious cover are generally thought to be less impaired, the most sensitive taxa of stream macro-invertebrates can be adversely impacted at levels below 5% or less.

Impervious surfaces can also be viewed as an indicator of economic growth and investment benefiting the livelihoods of local communities.



Percent Impervious Cover Change by Watershed

Interpretation

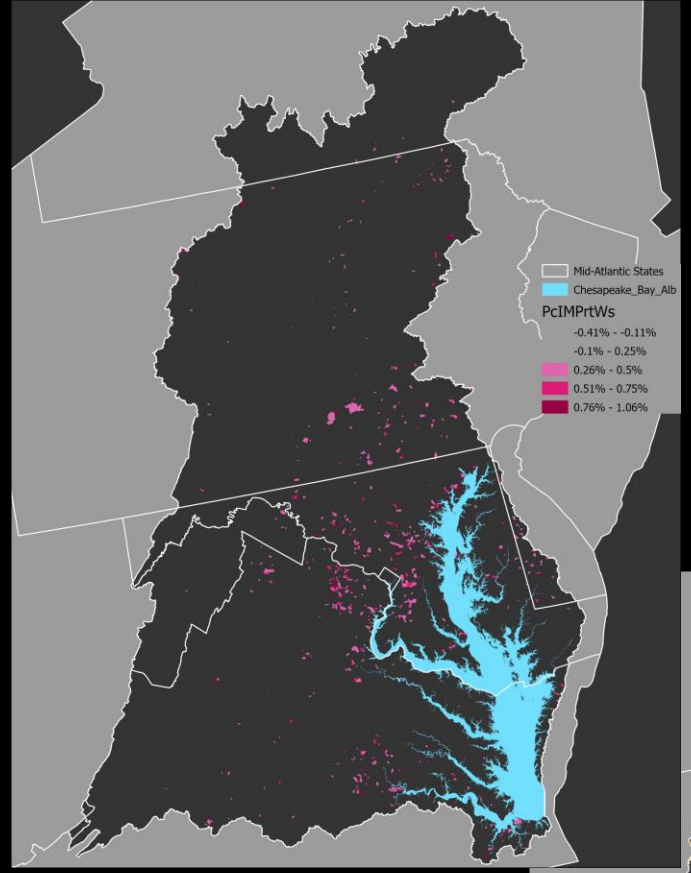
This indicator highlights where increases in impervious cover are occurring. The nature of development can vary greatly (e.g., roads, parking lots, poultry houses, warehouses, residential homes, industrial parks, etc.). This information is provided with the anticipation that it will be used by states, localities, NGOs, and the public to ensure that sensitive and valued resources are protected, and impervious surfaces are minimized and mitigated through land use planning and the implementation of Best Management Practices.

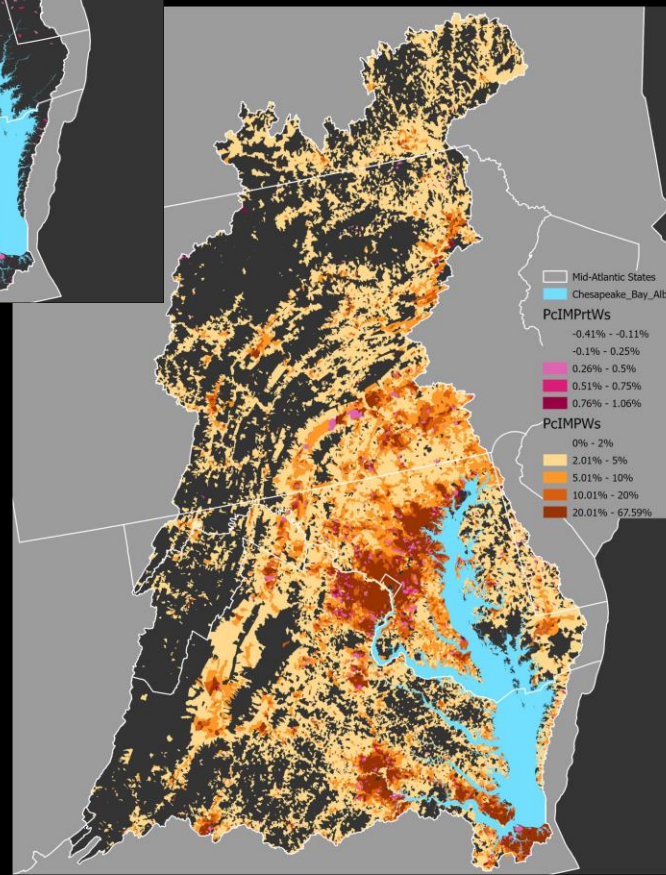
Applies to:

Watershed health, Water Quality, and Communities

Notes

The human population of the Bay watershed has increased by over a million persons per decade since the 1950's. This trend is expected to continue at least through 2050. Development is associated with population growth among other factors and so increases in impervious cover are expected into the foreseeable future.

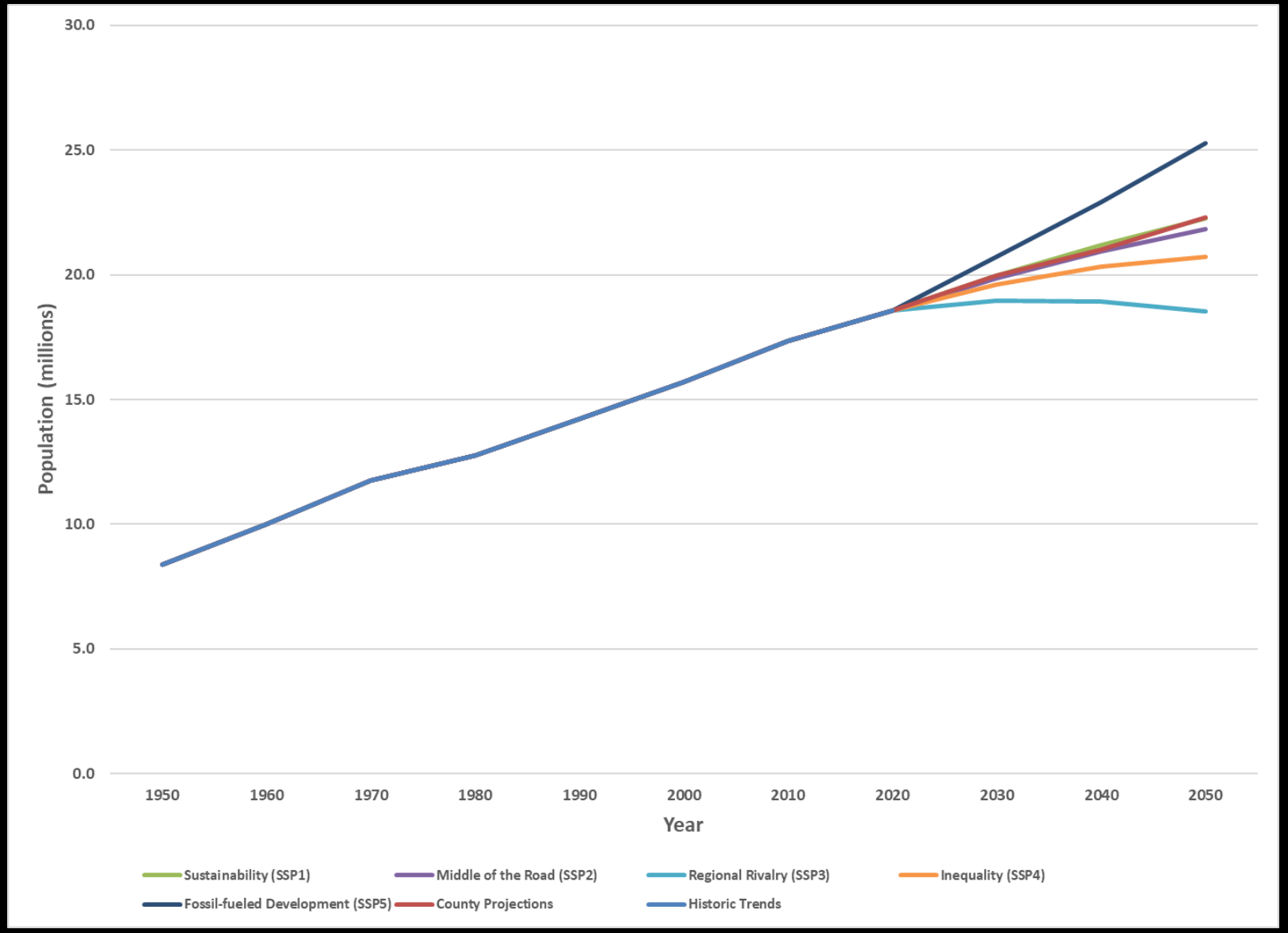




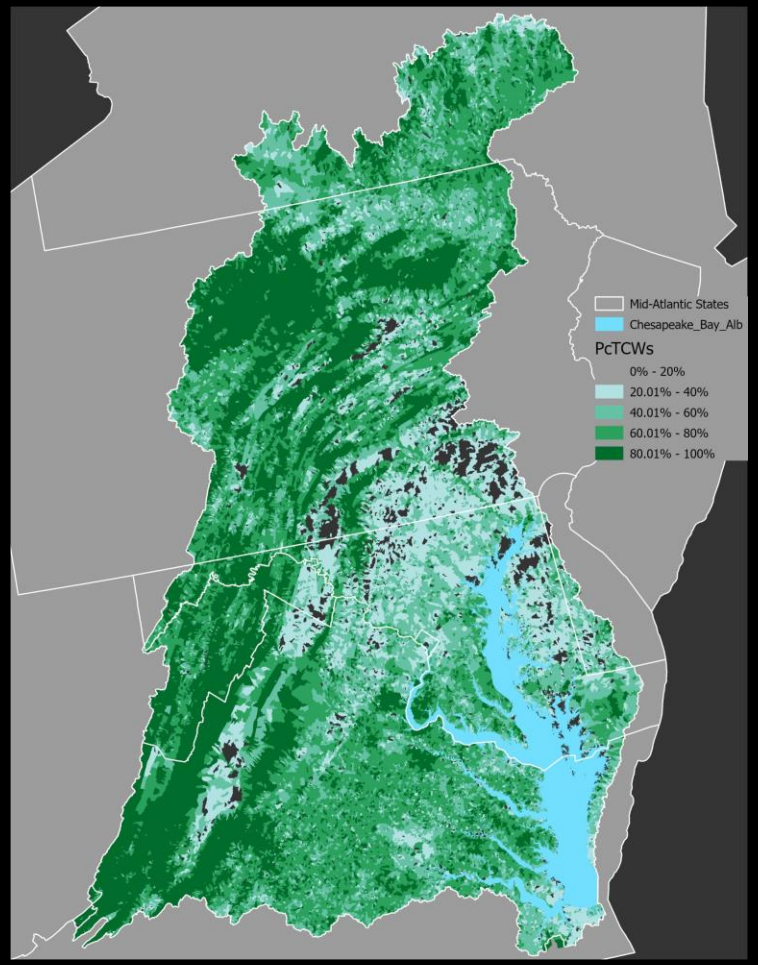
Impervious Surface Change: + 50,651 acres (x %)

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW	WATR	Decrease
ROAD	-	13.6	338.5	696.1	73.6	65.6	205.6	137.8	74.6	1.2	17.2	11.2	13.6	3.9	0.2	1.7	0.0	2.3	1,656.6
IMPS	1.3	-	937.4	508.2	277.2	87.7	143.4	6.7	1.8	0.9	37.4	75.1	84.0	2.4	0.1	0.2	0.0	0.8	2,164.6
IMPO	515.9	3,173.2	-	1,587.1	4,334.1	304.6	1,288.5	165.6	60.1	102.4	784.9	652.1	1,331.0	1.5	20.6	25.0	4.6	34.6	14,385.6
TCIS	41.7	485.1	689.5	-	2,445.8	-	1,598.7	-	-	180.5	408.2	98.1	184.0	6.1	3.5	6.6	0.5	0.9	6,149.4
TURF	0.0	827.8	5,558.2	0.0	-	8,513.5	1,089.0	107.3	106.5	20.7	126.8	3.1	7.8	724.6	-	-	-	-	17,085.2
TCTG	13.5	929.8	4,143.3	10.6	11,096.1	-	783.1	-	-	92.6	421.7	245.7	538.9	9.0	-	-	-	2.1	18,286.4
PDEV	1,129.6	4,377.1	6,865.1	0.0	15,251.3	48.5	-	304.4	33.3	221.0	417.5	142.2	79.3	1,270.4	-	-	-	100.9	30,240.6
FORE	1,160.9	2,764.4	8,917.9	732.0	13,095.7	28,220.6	28,107.2	-	22,045.6	175,564.1	81,474.4	19,557.1	23,185.7	4,065.8	1,380.6	5,567.7	193.2	296.9	416,329.8
TCOT	122.7	951.7	2,338.9	0.0	2,068.1	2,031.5	2,341.2	-	-	788.2	2,277.8	3,075.5	4,566.3	386.3	108.3	250.3	26.6	42.2	21,375.5
HARF	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2
NATS	63.1	148.9	476.6	0.4	3,481.5	370.7	825.6	76,425.3	4,388.8	4,294.5	-	545.9	356.2	500.6	-	-	-	1,089.7	92,967.7
CROP	500.4	3,018.3	8,368.9	0.2	4,030.5	165.3	2,513.9	11,299.2	3,088.3	1,367.3	2,068.6	-	125.9	1,182.5	-	-	-	779.8	38,508.9
PAST	307.3	2,252.7	9,606.9	0.1	6,561.6	184.7	3,857.2	13,162.5	8,983.8	1,631.2	4,035.2	122.6	-	1,232.2	-	-	-	401.7	52,339.8
EXTR	-	-	-	-	-	-	0.1	-	-	-	0.0	0.0	0.0	-	-	-	-	-	0.1
TDLW	2.4	4.2	91.5	0.0	1.0	-	-	1,745.6	161.6	7.6	0.0	-	-	0.2	-	-	-	72.7	2,086.8
RIVW	9.2	30.8	104.3	0.0	167.3	-	-	7,498.9	512.4	207.8	0.0	-	-	20.2	-	-	-	156.1	8,706.9
TERW	2.2	8.7	42.9	-	40.8	1.9	28.0	629.1	85.5	10.6	11.1	15.9	4.6	15.0	-	-	-	36.2	932.6
WATR	1.7	5.0	130.1	0.0	50.5	15.0	64.7	75.3	152.6	0.0	66.3	71.1	73.0	213.2	27.8	22.4	6.6	-	975.3
Increase	3,871.9	18,991.4	48,609.9	3,534.5	62,975.2	40,009.8	42,846.1	111,557.6	39,694.7	184,490.7	92,147.1	24,615.7	30,550.2	9,633.8	1,541.0	5,873.9	231.6	3,017.0	724,192.0
TotIncrease	**3,871.9**	**18,991.4**	**48,609.9**	**3,534.5**	**62,975.2**	**40,009.8**	**42,846.1**	**111,557.6**	**39,694.7**	**184,490.7**	**92,147.1**	**24,615.7**	**30,550.2**	**9,633.8**	**1,541.0**	**5,873.9**	**231.6**	**3,017.0**	
TotDecrease	**1,656.6**	**2,164.6**	**14,385.6**	**6,149.4**	**17,085.2**	**18,286.4**	**30,240.6**	**416,329.8**	**21,375.5**	**0.2**	**92,967.7**	**38,508.9**	**52,339.8**	**0.1**	**2,086.8**	**8,706.9**	**932.6**	**975.3**	
Net	**2,215.3**	**16,826.7**	**34,224.3**	**(2,614.9)**	**45,890.0**	**21,723.3**	**12,605.5**	**(304,772.2)**	**18,319.3**	**184,490.6**	**(820.6)**	**(13,893.2)**	**(21,789.6)**	**9,633.7**	**(545.8)**	**(2,833.0)**	**(701.0)**	**2,041.8**	

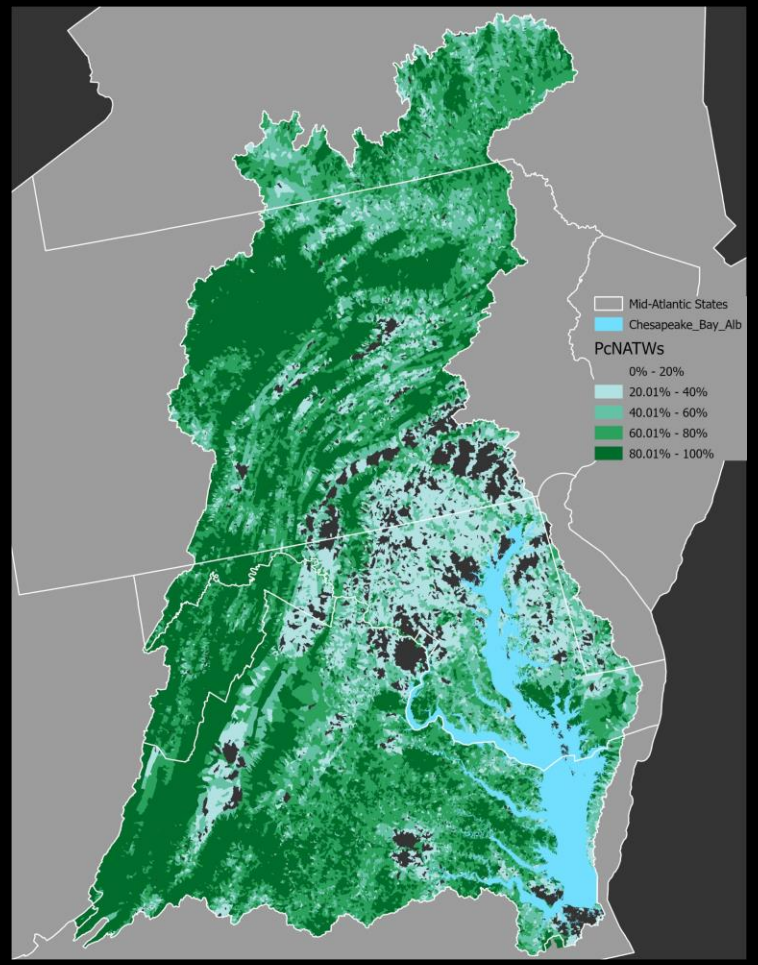
Impervious Cover Change Supporting Information: Population Growth in the Bay Watershed



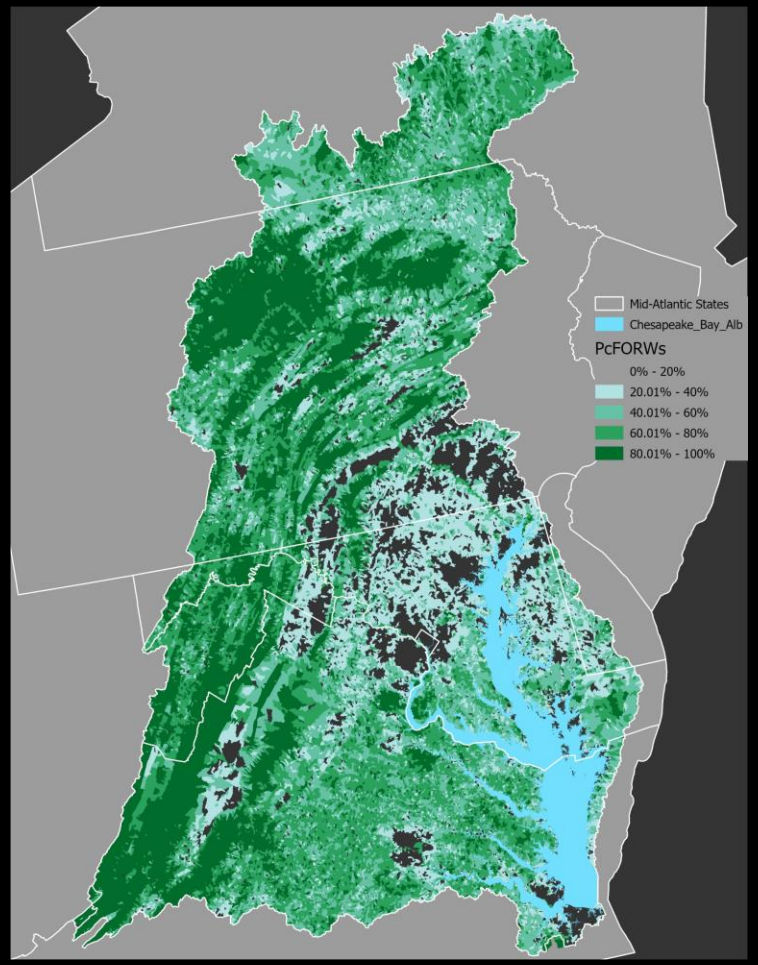
Tree Cover, Natural Land, and Forest Cover Indicators



Tree Cover includes all standing trees, including those in developed areas

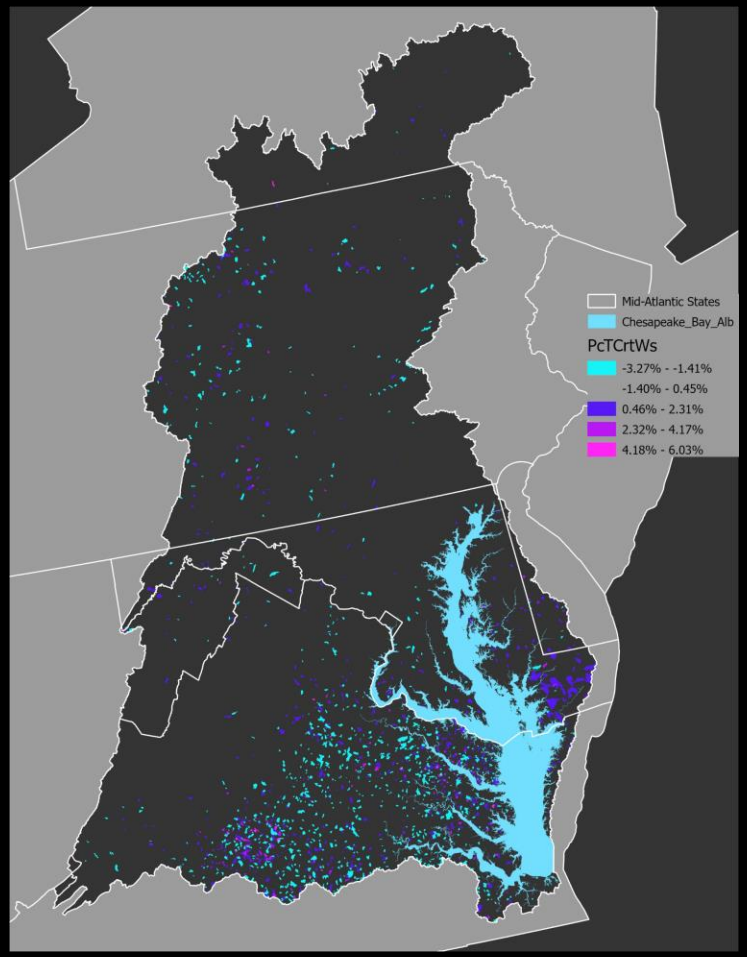


Natural lands exclude trees in developed areas but includes successional lands

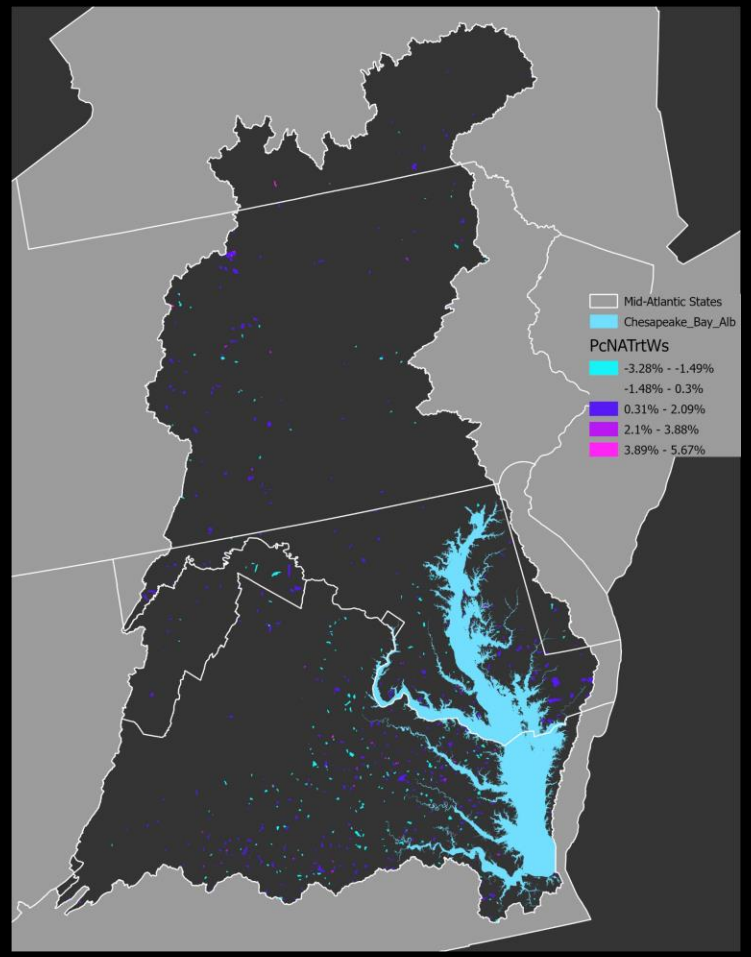


Forest cover is most restrictive, excluding timber harvests and trees in developed areas

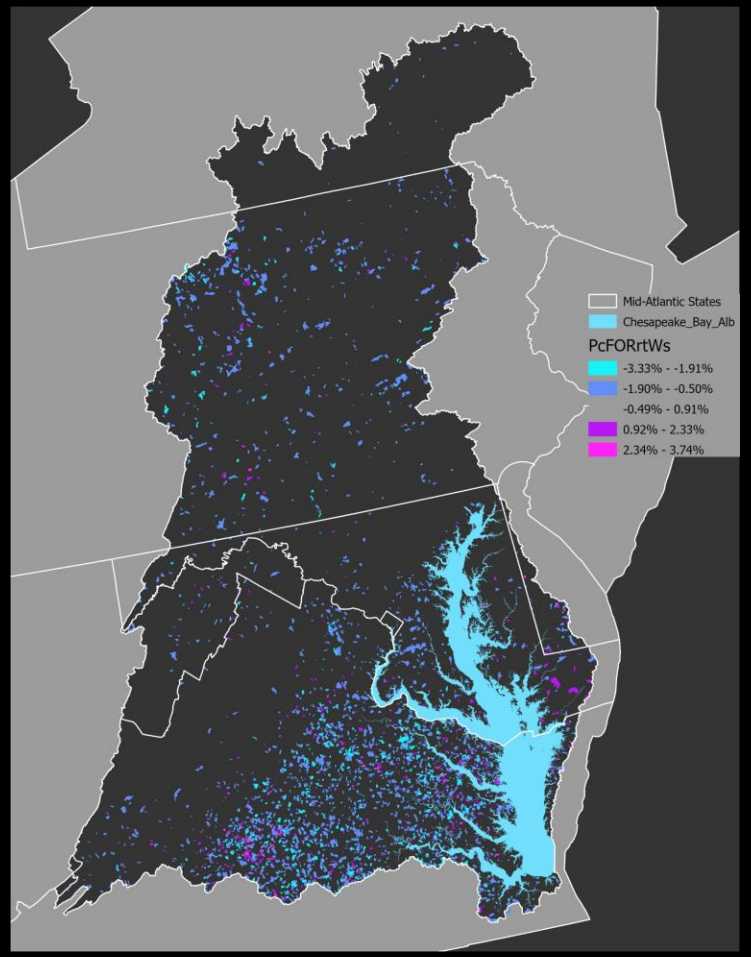
Tree Cover, Natural Land, and Forest Change Indicators



Tree cover change highlights changes due to forestry and urbanization, excluding fragmentation



Natural land change minimizes effects of forestry and urbanization but includes wetland change



Forest change highlights forestry and urbanization, including all change resulting in fragmentation

Tree Cover Net Change: - 267,345 acres (=1.1%)

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW	WATR	Decrease
ROAD	-	13.6	338.5	696.1	73.6	65.6	205.6	137.8	74.6	1.2	17.2	11.2	13.6	3.9	0.2	1.7	0.0	2.3	1,656.6
IMPS	1.3	-	937.4	508.2	277.2	87.7	143.4	6.7	1.8	0.9	37.4	75.1	84.0	2.4	0.1	0.2	0.0	0.8	2,164.6
IMPO	515.9	3,173.2	-	1,587.1	4,334.1	304.6	1,288.5	165.6	60.1	102.4	784.9	652.1	1,331.0	1.5	20.6	25.0	4.6	34.6	14,385.6
TCIS	41.7	485.1	689.5	-	2,445.8	-	1,598.7	-	-	180.5	408.2	98.1	184.0	6.1	3.5	6.6	0.5	0.9	6,149.4
TURF	0.0	827.8	5,558.2	0.0	-	8,513.5	1,089.0	107.3	106.5	20.7	126.8	3.1	7.8	724.6	-	-	-	-	17,085.2
TCTG	13.5	929.8	4,143.3	10.6	11,096.1	-	783.1	-	-	92.6	421.7	245.7	538.9	9.0	-	-	-	2.1	18,286.4
PDEV	1,129.6	4,377.1	6,865.1	0.0	15,251.3	48.5	-	304.4	33.3	221.0	417.5	142.2	79.3	1,270.4	-	-	-	100.9	30,240.6
FORE	1,160.9	2,764.4	8,917.9	732.0	13,095.7	28,220.6	28,107.2	-	22,045.6	175,564.1	81,474.4	19,557.1	23,185.7	4,065.8	1,380.6	5,567.7	193.2	296.9	416,329.8
TCOT	122.7	951.7	2,338.9	0.0	2,068.1	2,031.5	2,341.2	-	-	788.2	2,277.8	3,075.5	4,566.3	386.3	108.3	250.3	26.6	42.2	21,375.5
HARF	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2
NATS	63.1	148.9	476.6	0.4	3,481.5	370.7	825.6	76,425.3	4,388.8	4,294.5	-	545.9	356.2	500.6	-	-	-	1,089.7	92,967.7
CROP	500.4	3,018.3	8,368.9	0.2	4,030.5	165.3	2,513.9	11,299.2	3,088.3	1,367.3	2,068.6	-	125.9	1,182.5	-	-	-	779.8	38,508.9
PAST	307.3	2,252.7	9,606.9	0.1	6,561.6	184.7	3,857.2	13,162.5	8,983.8	1,631.2	4,035.2	122.6	-	1,232.2	-	-	-	401.7	52,339.8
EXTR	-	-	-	-	-	-	0.1	-	-	-	0.0	0.0	0.0	-	-	-	-	-	0.1
TDLW	2.4	4.2	91.5	0.0	1.0	-	-	1,745.6	161.6	7.6	0.0	-	-	0.2	-	-	-	72.7	2,086.8
RIVW	9.2	30.8	104.3	0.0	167.3	-	-	7,498.9	512.4	207.8	0.0	-	-	20.2	-	-	-	156.1	8,706.9
TERW	2.2	8.7	42.9	-	40.8	1.9	28.0	629.1	85.5	10.6	11.1	15.9	4.6	15.0	-	-	-	36.2	932.6
WATR	1.7	5.0	130.1	0.0	50.5	15.0	64.7	75.3	152.6	0.0	66.3	71.1	73.0	213.2	27.8	22.4	6.6	-	975.3
Increase	3,871.9	18,991.4	48,609.9	3,534.5	62,975.2	40,009.8	42,846.1	111,557.6	39,694.7	184,490.7	92,147.1	24,615.7	30,550.2	9,633.8	1,541.0	5,873.9	231.6	3,017.0	724,192.0
TotIncrease	**3,871.9**	**18,991.4**	**48,609.9**	**3,534.5**	**62,975.2**	**40,009.8**	**42,846.1**	**111,557.6**	**39,694.7**	**184,490.7**	**92,147.1**	**24,615.7**	**30,550.2**	**9,633.8**	**1,541.0**	**5,873.9**	**231.6**	**3,017.0**	
TotDecrease	**1,656.6**	**2,164.6**	**14,385.6**	**6,149.4**	**17,085.2**	**18,286.4**	**30,240.6**	**416,329.8**	**21,375.5**	**0.2**	**92,967.7**	**38,508.9**	**52,339.8**	**0.1**	**2,086.8**	**8,706.9**	**932.6**	**975.3**	
Net	**2,215.3**	**16,826.7**	**34,224.3**	**(2,614.9)**	**45,890.0**	**21,723.3**	**12,605.5**	**(304,772.2)**	**18,319.3**	**184,490.6**	**(820.6)**	**(13,893.2)**	**(21,789.6)**	**9,633.7**	**(545.8)**	**(2,833.0)**	**(701.0)**	**2,041.8**	

Natural Land Net Change: - 106,863 acres (0.4%)

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW	WATR	Decrease
ROAD	-	13.6	338.5	696.1	73.6	65.6	205.6	137.8	74.6	1.2	17.2	11.2	13.6	3.9	0.2	1.7	0.0	2.3	1,656.6
IMPS	1.3	-	937.4	508.2	277.2	87.7	143.4	6.7	1.8	0.9	37.4	75.1	84.0	2.4	0.1	0.2	0.0	0.8	2,164.6
IMPO	515.9	3,173.2	-	1,587.1	4,334.1	304.6	1,288.5	165.6	60.1	102.4	784.9	652.1	1,331.0	1.5	20.6	25.0	4.6	34.6	14,385.6
TCIS	41.7	485.1	689.5	-	2,445.8	-	1,598.7	-	-	180.5	408.2	98.1	184.0	6.1	3.5	6.6	0.5	0.9	6,149.4
TURF	0.0	827.8	5,558.2	0.0	-	8,513.5	1,089.0	107.3	106.5	20.7	126.8	3.1	7.8	724.6	-	-	-	-	17,085.2
TCTG	13.5	929.8	4,143.3	10.6	11,096.1	-	783.1	-	-	92.6	421.7	245.7	538.9	9.0	-	-	-	2.1	18,286.4
PDEV	1,129.6	4,377.1	6,865.1	0.0	15,251.3	48.5	-	304.4	33.3	221.0	417.5	142.2	79.3	1,270.4	-	-	-	100.9	30,240.6
FORE	1,160.9	2,764.4	8,917.9	732.0	13,095.7	28,220.6	28,107.2	-	22,045.6	175,564.1	81,474.4	19,557.1	23,185.7	4,065.8	1,380.6	5,567.7	193.2	296.9	416,329.8
TCOT	122.7	951.7	2,338.9	0.0	2,068.1	2,031.5	2,341.2	-	-	788.2	2,277.8	3,075.5	4,566.3	386.3	108.3	250.3	26.6	42.2	21,375.5
HARF	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2
NATS	63.1	148.9	476.6	0.4	3,481.5	370.7	825.6	76,425.3	4,388.8	4,294.5	-	545.9	356.2	500.6	-	-	-	1,089.7	92,967.7
CROP	500.4	3,018.3	8,368.9	0.2	4,030.5	165.3	2,513.9	11,299.2	3,088.3	1,367.3	2,068.6	-	125.9	1,182.5	-	-	-	779.8	38,508.9
PAST	307.3	2,252.7	9,606.9	0.1	6,561.6	184.7	3,857.2	13,162.5	8,983.8	1,631.2	4,035.2	122.6	-	1,232.2	-	-	-	401.7	52,339.8
EXTR	-	-	-	-	-	-	0.1	-	-	-	0.0	0.0	0.0	-	-	-	-	-	0.1
TDLW	2.4	4.2	91.5	0.0	1.0	-	-	1,745.6	161.6	7.6	0.0	-	-	0.2	-	-	-	72.7	2,086.8
RIVW	9.2	30.8	104.3	0.0	167.3	-	-	7,498.9	512.4	207.8	0.0	-	-	20.2	-	-	-	156.1	8,706.9
TERW	2.2	8.7	42.9	-	40.8	1.9	28.0	629.1	85.5	10.6	11.1	15.9	4.6	15.0	-	-	-	36.2	932.6
WATR	1.7	5.0	130.1	0.0	50.5	15.0	64.7	75.3	152.6	0.0	66.3	71.1	73.0	213.2	27.8	22.4	6.6	-	975.3
Increase	3,871.9	18,991.4	48,609.9	3,534.5	62,975.2	40,009.8	42,846.1	111,557.6	39,694.7	184,490.7	92,147.1	24,615.7	30,550.2	9,633.8	1,541.0	5,873.9	231.6	3,017.0	724,192.0
TotIncrease	**3,871.9**	**18,991.4**	**48,609.9**	**3,534.5**	**62,975.2**	**40,009.8**	**42,846.1**	**111,557.6**	**39,694.7**	**184,490.7**	**92,147.1**	**24,615.7**	**30,550.2**	**9,633.8**	**1,541.0**	**5,873.9**	**231.6**	**3,017.0**	
TotDecrease	**1,656.6**	**2,164.6**	**14,385.6**	**6,149.4**	**17,085.2**	**18,286.4**	**30,240.6**	**416,329.8**	**21,375.5**	**0.2**	**92,967.7**	**38,508.9**	**52,339.8**	**0.1**	**2,086.8**	**8,706.9**	**932.6**	**975.3**	
Net	**2,215.3**	**16,826.7**	**34,224.3**	**(2,614.9)**	**45,890.0**	**21,723.3**	**12,605.5**	**(304,772.2)**	**18,319.3**	**184,490.6**	**(820.6)**	**(13,893.2)**	**(21,789.6)**	**9,633.7**	**(545.8)**	**(2,833.0)**	**(701.0)**	**2,041.8**	

Forest Cover Net Change: - 304,772 acres* (-1.3%)

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW	WATR	Decrease
ROAD	-	13.6	338.5	696.1	73.6	65.6	205.6	137.8	74.6	1.2	17.2	11.2	13.6	3.9	0.2	1.7	0.0	2.3	1,656.6
IMPS	1.3	-	937.4	508.2	277.2	87.7	143.4	6.7	1.8	0.9	37.4	75.1	84.0	2.4	0.1	0.2	0.0	0.8	2,164.6
IMPO	515.9	3,173.2	-	1,587.1	4,334.1	304.6	1,288.5	165.6	60.1	102.4	784.9	652.1	1,331.0	1.5	20.6	25.0	4.6	34.6	14,385.6
TCIS	41.7	485.1	689.5	-	2,445.8	-	1,598.7	-	-	180.5	408.2	98.1	184.0	6.1	3.5	6.6	0.5	0.9	6,149.4
TURF	0.0	827.8	5,558.2	0.0	-	8,513.5	1,089.0	107.3	106.5	20.7	126.8	3.1	7.8	724.6	-	-	-	-	17,085.2
TCTG	13.5	929.8	4,143.3	10.6	11,096.1	-	783.1	-	-	92.6	421.7	245.7	538.9	9.0	-	-	-	2.1	18,286.4
PDEV	1,129.6	4,377.1	6,865.1	0.0	15,251.3	48.5	-	304.4	33.3	221.0	417.5	142.2	79.3	1,270.4	-	-	-	100.9	30,240.6
FORE	1,160.9	2,764.4	8,917.9	732.0	13,095.7	28,220.6	28,107.2	-	22,045.6	175,564.1	81,474.4	19,557.1	23,185.7	4,065.8	1,380.6	5,567.7	193.2	296.9	416,329.8
TCOT	122.7	951.7	2,338.9	0.0	2,068.1	2,031.5	2,341.2	-	-	788.2	2,277.8	3,075.5	4,566.3	386.3	108.3	250.3	26.6	42.2	21,375.5
HARF	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2
NATS	63.1	148.9	476.6	0.4	3,481.5	370.7	825.6	76,425.3	4,388.8	4,294.5	-	545.9	356.2	500.6	-	-	-	1,089.7	92,967.7
CROP	500.4	3,018.3	8,368.9	0.2	4,030.5	165.3	2,513.9	11,299.2	3,088.3	1,367.3	2,068.6	-	125.9	1,182.5	-	-	-	779.8	38,508.9
PAST	307.3	2,252.7	9,606.9	0.1	6,561.6	184.7	3,857.2	13,162.5	8,983.8	1,631.2	4,035.2	122.6	-	1,232.2	-	-	-	401.7	52,339.8
EXTR	-	-	-	-	-	-	0.1	-	-	-	0.0	0.0	0.0	-	-	-	-	-	0.1
TDLW	2.4	4.2	91.5	0.0	1.0	-	-	1,745.6	161.6	7.6	0.0	-	-	0.2	-	-	-	72.7	2,086.8
RIVW	9.2	30.8	104.3	0.0	167.3	-	-	7,498.9	512.4	207.8	0.0	-	-	20.2	-	-	-	156.1	8,706.9
TERW	2.2	8.7	42.9	-	40.8	1.9	28.0	629.1	85.5	10.6	11.1	15.9	4.6	15.0	-	-	-	36.2	932.6
WATR	1.7	5.0	130.1	0.0	50.5	15.0	64.7	75.3	152.6	0.0	66.3	71.1	73.0	213.2	27.8	22.4	6.6	-	975.3
Increase	3,871.9	18,991.4	48,609.9	3,534.5	62,975.2	40,009.8	42,846.1	111,557.6	39,694.7	184,490.7	92,147.1	24,615.7	30,550.2	9,633.8	1,541.0	5,873.9	231.6	3,017.0	724,192.0
TotIncrease	**3,871.9**	**18,991.4**	**48,609.9**	**3,534.5**	**62,975.2**	**40,009.8**	**42,846.1**	**111,557.6**	**39,694.7**	**184,490.7**	**92,147.1**	**24,615.7**	**30,550.2**	**9,633.8**	**1,541.0**	**5,873.9**	**231.6**	**3,017.0**	
TotDecrease	**1,656.6**	**2,164.6**	**14,385.6**	**6,149.4**	**17,085.2**	**18,286.4**	**30,240.6**	**416,329.8**	**21,375.5**	**0.2**	**92,967.7**	**38,508.9**	**52,339.8**	**0.1**	**2,086.8**	**8,706.9**	**932.6**	**975.3**	
Net	**2,215.3**	**16,826.7**	**34,224.3**	**(2,614.9)**	**45,890.0**	**21,723.3**	**12,605.5**	**(304,772.2)**	**18,319.3**	**184,490.6**	**(820.6)**	**(13,893.2)**	**(21,789.6)**	**9,633.7**	**(545.8)**	**(2,833.0)**	**(701.0)**	**2,041.8**	

* Most of this change (-257,039 acres) is likely associated with timber harvest activities and should not be considered a loss

Community Tree Cover and Change by Watershed

Interpretation

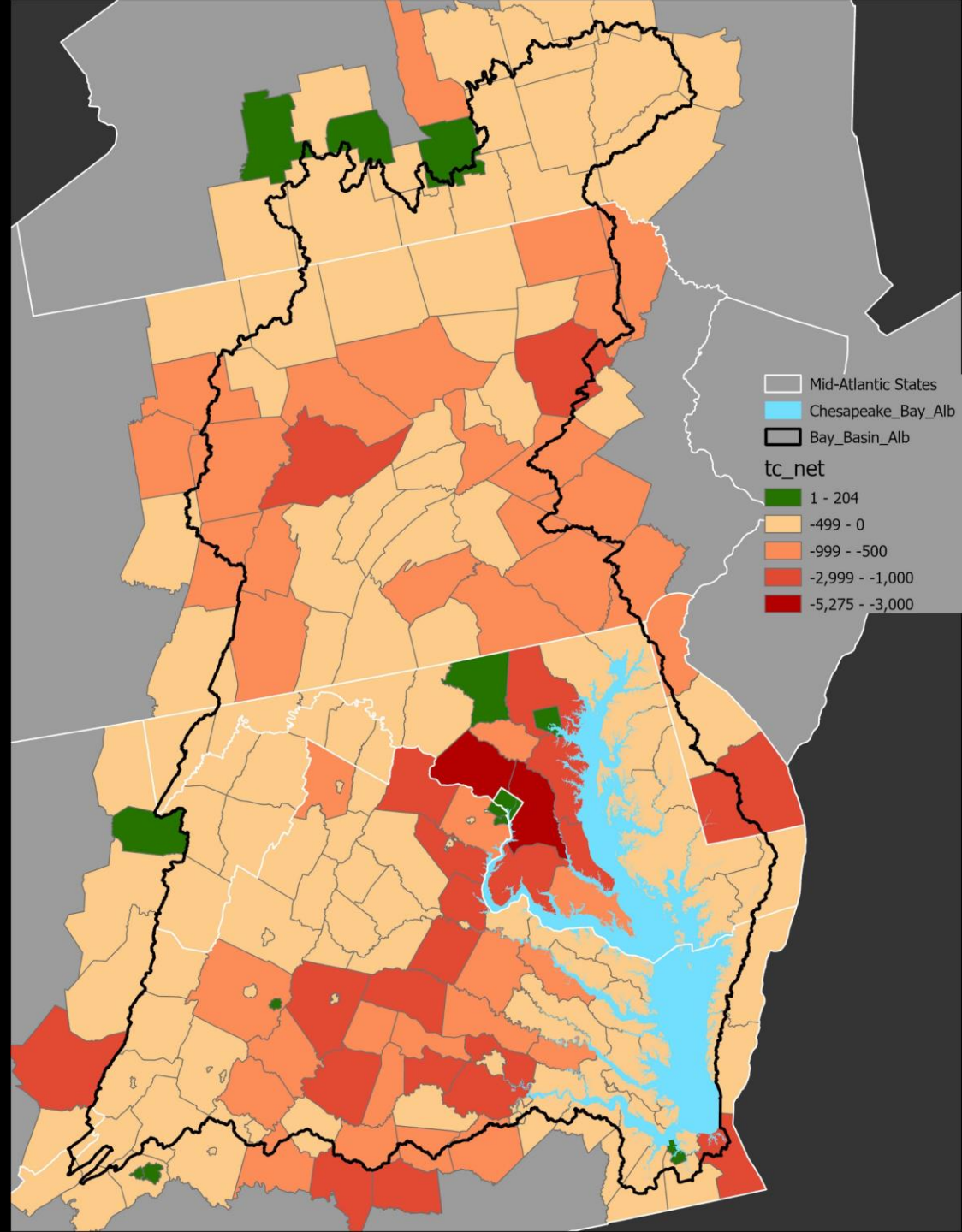
Tree Cover in developed areas is important to reduce runoff, provide shade and moderate temperature, wildlife habitat, air quality, aesthetics, and to improve quality of life and sense of place. This indicator is consistent with the indicator used for the Tree Canopy Outcome. For Land Use Methods and Metrics Outcome, this indicator is displayed at a catchment level (not yet available).

Applies to:

Watershed health, Water Quality, and Communities

Notes

This indictor shows the overall net change in tree cover associated with development and includes all development, both outside and inside designated urban or community boundaries. Due to data limitations, this indicator does not yet fully account for increases in canopy due to the growth of existing trees or the recent planting of small trees.



Community Tree Cover Change: -71,286 acres (-5.1%)

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW	WATR	Decrease
ROAD	-	13.6	338.5	696.1	73.6	65.6	205.6	137.8	74.6	1.2	17.2	11.2	13.6	3.9	0.2	1.7	0.0	2.3	1,656.6
IMPS	1.3	-	937.4	508.2	277.2	87.7	143.4	6.7	1.8	0.9	37.4	75.1	84.0	2.4	0.1	0.2	0.0	0.8	2,164.6
IMPO	515.9	3,173.2	-	1,587.1	4,334.1	304.6	1,288.5	165.6	60.1	102.4	784.9	652.1	1,331.0	1.5	20.6	25.0	4.6	34.6	14,385.6
TCIS	41.7	485.1	689.5	-	2,445.8	-	1,598.7	-	-	180.5	408.2	98.1	184.0	6.1	3.5	6.6	0.5	0.9	6,149.4
TURF	0.0	827.8	5,558.2	0.0	-	8,513.5	1,089.0	107.3	106.5	20.7	126.8	3.1	7.8	724.6	-	-	-	-	17,085.2
TCTG	13.5	929.8	4,143.3	10.6	11,096.1	-	783.1	-	-	92.6	421.7	245.7	538.9	9.0	-	-	-	2.1	18,286.4
PDEV	1,129.6	4,377.1	6,865.1	0.0	15,251.3	48.5	-	304.4	33.3	221.0	417.5	142.2	79.3	1,270.4	-	-	-	100.9	30,240.6
FORE	1,160.9	2,764.4	8,917.9	732.0	13,095.7	28,220.6	28,107.2	-	22,045.6	175,564.1	81,474.4	19,557.1	23,185.7	4,065.8	1,380.6	5,567.7	193.2	296.9	416,329.8
TCOT	122.7	951.7	2,338.9	0.0	2,068.1	2,031.5	2,341.2	-	-	788.2	2,277.8	3,075.5	4,566.3	386.3	108.3	250.3	26.6	42.2	21,375.5
HARF	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2
NATS	63.1	148.9	476.6	0.4	3,481.5	370.7	825.6	76,425.3	4,388.8	4,294.5	-	545.9	356.2	500.6	-	-	-	1,089.7	92,967.7
CROP	500.4	3,018.3	8,368.9	0.2	4,030.5	165.3	2,513.9	11,299.2	3,088.3	1,367.3	2,068.6	-	125.9	1,182.5	-	-	-	779.8	38,508.9
PAST	307.3	2,252.7	9,606.9	0.1	6,561.6	184.7	3,857.2	13,162.5	8,983.8	1,631.2	4,035.2	122.6	-	1,232.2	-	-	-	401.7	52,339.8
EXTR	-	-	-	-	-	-	0.1	-	-	-	0.0	0.0	0.0	-	-	-	-	-	0.1
TDLW	2.4	4.2	91.5	0.0	1.0	-	-	1,745.6	161.6	7.6	0.0	-	-	0.2	-	-	-	72.7	2,086.8
RIVW	9.2	30.8	104.3	0.0	167.3	-	-	7,498.9	512.4	207.8	0.0	-	-	20.2	-	-	-	156.1	8,706.9
TERW	2.2	8.7	42.9	-	40.8	1.9	28.0	629.1	85.5	10.6	11.1	15.9	4.6	15.0	-	-	-	36.2	932.6
WATR	1.7	5.0	130.1	0.0	50.5	15.0	64.7	75.3	152.6	0.0	66.3	71.1	73.0	213.2	27.8	22.4	6.6	-	975.3
Increase	3,871.9	18,991.4	48,609.9	3,534.5	62,975.2	40,009.8	42,846.1	111,557.6	39,694.7	184,490.7	92,147.1	24,615.7	30,550.2	9,633.8	1,541.0	5,873.9	231.6	3,017.0	724,192.0
TotIncrease	**3,871.9**	**18,991.4**	**48,609.9**	**3,534.5**	**62,975.2**	**40,009.8**	**42,846.1**	**111,557.6**	**39,694.7**	**184,490.7**	**92,147.1**	**24,615.7**	**30,550.2**	**9,633.8**	**1,541.0**	**5,873.9**	**231.6**	**3,017.0**	
TotDecrease	**1,656.6**	**2,164.6**	**14,385.6**	**6,149.4**	**17,085.2**	**18,286.4**	**30,240.6**	**416,329.8**	**21,375.5**	**0.2**	**92,967.7**	**38,508.9**	**52,339.8**	**0.1**	**2,086.8**	**8,706.9**	**932.6**	**975.3**	
Net	**2,215.3**	**16,826.7**	**34,224.3**	**(2,614.9)**	**45,890.0**	**21,723.3**	**12,605.5**	**(304,772.2)**	**18,319.3**	**184,490.6**	**(820.6)**	**(13,893.2)**	**(21,789.6)**	**9,633.7**	**(545.8)**	**(2,833.0)**	**(701.0)**	**2,041.8**	

Gain = 12,809

Loss = 84,095

LUMM Indicators Planned for Release in 2023

Effective[1] Impervious Cover (2017/18) and Impervious Cover Change (2013/14 to 2017/18)
Percent and acres of effective impervious cover and impervious cover change by catchment and watershed

Farmland[2] Conversion to Development (2013/14 to 2017/18)
Acres of farmland converted to development by municipality, place, and county

Natural[3] Land Conversion to Development (2013/14 to 2017/18)
Acres of natural land converted to development by municipality, place, and county

Riparian[4] Natural Lands (2017/18) and Natural Land Change (2013/14 to 2017/18)
Percent and acres of riparian natural land and natural land change by catchment and watershed

[1] Effective Impervious Cover = impervious cover weighted by its proximity to streams relative to ridges.
[2] Farmland = cropland and/or pasture
[3] Natural land = forest, other tree canopy, timber harvest, natural succession, and wetlands
[4] Riparian = area within 30 meters of streams (lakes, ponds, and Bay shoreline excluded)


USGS
science for a changing world